

# PATENT SPECIFICATION

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## COMPLETE SPECIFICATION

### Improvements in or relating to Moulding Apparatus

We, REGIE NATIONALE DES USINES RENAULT, of 8/10 Avenue Emile Zola, Billancourt (Seine), France, a French Body Corporate, and SOCIETE DES HAUTS-FOURNEAUX ET FORGES D'ALLEVARD, of 12, Rue de la Rochefoucauld, Paris (Seine), France, a French Body Corporate, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

In the field of pressure casting and moulding plastic materials, permanent cores are used which are capable of employment throughout a series of operations without being replaced or modified.

However, cores of this kind are expensive so that their use is limited by depreciation costs. It is therefore of primary importance to try to reduce as much as possible the wear to which the cores are subjected.

This wear is the more noticeable at high temperatures and working pressures of the moulded materials. Passing successively from plastic materials to zinc alloys, light metals, cuprous metals, pig iron and steel, the mould, chills and the cores are more and more subjected to deterioration (for the same number of moulded articles) and this results in destruction all the more quickly the higher the temperatures and working pressures are.

This deterioration is especially marked at the bearing surfaces of the cores where they slide into the appropriate housings in the body of the mould.

Fluid-tightness between the cores and their housings is rapidly destroyed; infiltration of the moulded material causes jamming which becomes more serious with each operation, or else the wear which is produced prevents the core from being positioned accurately and results in defective mouldings.

The object of the invention is to obviate these disadvantages.

According to the present invention there is provided the combination of a detachable core and a mould or chill, wherein holes are formed

in the mould or chill, the holes each having a frusto-conical portion to receive a correspondingly shaped guide surface on said core, the slope of the frusto-conical portions and the guide surfaces relative to an axis passing longitudinally through the centre of said holes and through the centre of the core being not less than 3° and not more than 45°, and wherein each of said holes includes a portion defining a cylindrical bore of short length measured in the direction of said axis, said bore providing communication between the associated frusto-conical portion and the internal cavity of the mould or chill, the arrangement being such that when the core is in position for a moulding operation a cylindrical portion of said core is within and spaced radially from each cylindrical bore of the mould or chill thus forming a small annular clearance between the core and the mould.

Constructional forms of the invention are illustrated by way of non-limitative examples in the accompanying drawings:—

Fig. 1 is a view of a mould having a single core comprising two bearing surfaces;

Fig. 2 shows a mould whose core is formed of two opposite elements.

Referring now to the drawings, Fig. 1 shows a core 1, conical bearing surfaces 2 and 3 of which contact the surfaces of the holes provided in the mould 4, the angle  $\alpha$  of the generatrices with the axis of the core being approximately 30°.

On the inner side of the mould, the cylindrical middle portion of the core is continued for small distances at 5 and 6 into the walls of the mould. The said walls have corresponding cylindrical portions which allow at 7 and 8 small clearances of a few tenths of a millimetre for example .5 mm. between themselves and the core, over a height of the order of 1 to 5 mm.

In Fig. 2, the core is formed of two parts 9 and 10 each of which has a conical bearing surface 11 and 12 respectively flaring in the direction of withdrawal and followed by a cylindrical surface 13 or 14 which allows,

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- between the core and the mould, a small clearance 15 or 16 which permits of the deliberate formation of a burr which prevents any contact between the mould and the core whilst the latter is being withdrawn from the mould and, more particularly, prevents contact with a sharp edge, which would take place if the conical parts of the mould and core extended as far as the inner face of the mould.
- 10 WHAT WE CLAIM IS:—
1. The combination of a detachable core and a mould or chill, wherein holes are formed in the mould or chill, the holes each having a frusto-conical portion to receive a correspondingly shaped guide surface on said core, the slope of the frusto-conical portions and the guide surfaces relative to an axis passing longitudinally through the centre of said holes and through the centre of the core being not less than  $3^\circ$  and not more than  $45^\circ$ , and wherein each of said holes includes a portion defining a cylindrical bore of short length measured in the direction of said axis, said bore providing communication between the associated frusto-conical portion and the internal cavity of the mould or chill, the arrangement being such that when the core is in position for a moulding operation a cylindrical portion of said core is within and spaced radially from each cylindrical bore of the mould or chill thus forming a small annular clearance between the core and the mould.
2. The combination as claimed in Claim 1, wherein said annular clearance is a few tenths of a millimeter.
3. The combination substantially as hereinbefore described with reference to the accompanying drawing.
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Fig. 1

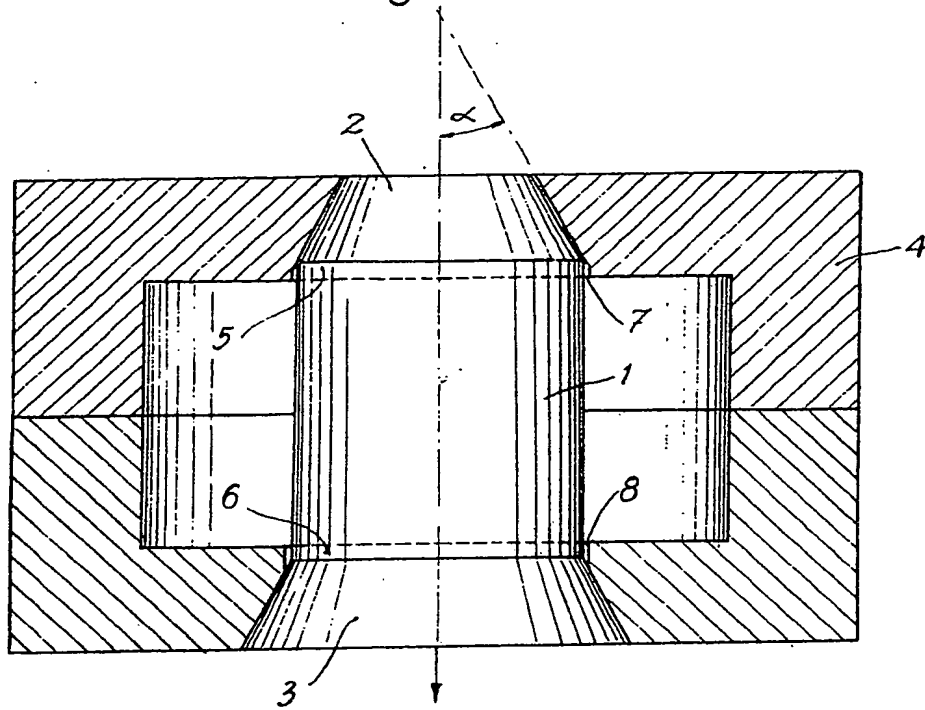
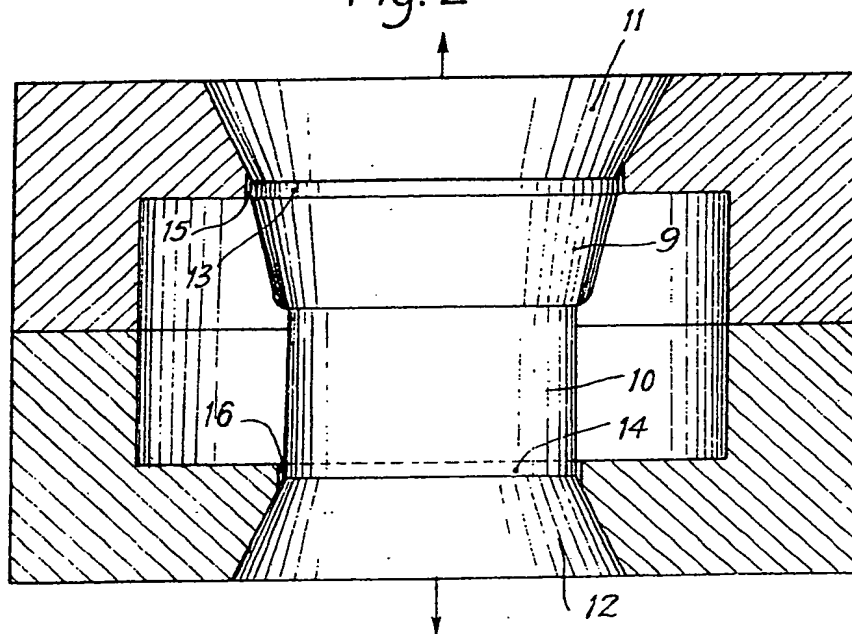


Fig. 2



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